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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,338	04/10/2006	Toshimichi Makii	2003JP323	1811

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AZ ELECTRONIC MATERIALS USA CORP.  
ATTENTION: INDUSTRIAL PROPERTY DEPT.  
70 MEISTER AVENUE  
SOMERVILLE, NJ 08876

EXAMINER

THOMPSON RUMMEL, PONDER N

ART UNIT	PAPER NUMBER
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1753

MAIL DATE	DELIVERY MODE
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09/11/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/575,338	Applicant(s) MAKII ET AL.	
	Examiner Ponder N. Thompson-Rummel	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/8/2007</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Wanat et al. (US 2003/0194636).

With respect to claims 1 and 8, Wanat et al. discloses a photoresist composition capable of forming a thick film having a film thickness of from 10 to 90  $\mu\text{m}$  (paragraph [0050]) comprising:

- A. An alkali-soluble novolak resins (paragraph [0015]);
- B. A polyhydroxystyrene including single polymers of vinylphenol and copolymers of vinyl phenol and acrylate derivative, acrylonitrile, a methacrylate derivative where alkali solubility suppressing groups such as a tert-butoxycarbonyl group or ethoxyethyl group may be substituted (paragraph [0020]);

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- C. A photoacid generator such as onium salts (paragraph [0040]);
- D. A photoactive component (photosensitizing agent) such as 1,2-naphthoquinonediazide-5-sulfonyl chloride and/or 1,2-naphthoquinonediazide-4-sulfonyl chloride (paragraph [0021]).

***Claim Rejections - 35 USC § 103***

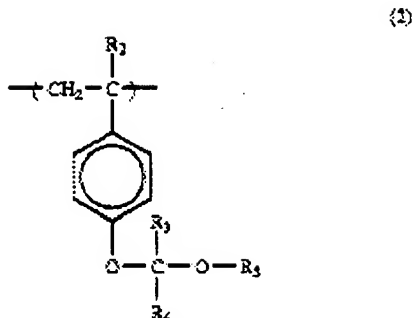
3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5, 7, 9-11 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwanaga et al (US 5,962,180) in view of Kawata et al. (US Patent 5,912,102).

With respect to claims 1, 2, 7, 9-11 and 16-19, Iwanaga et al discloses a radiation sensitive resin composition comprising:

- A. A polycondensation resin of at least a phenol and aldehyde (novolak – column 10, lines 64-66) in the amount of no more than 200 parts by weight (column 11, lines 10-13);
- B. An acetal copolymer of formula 2 (column 2, lines 40-52)



wherein  $R_2$  is a hydrogen atom or methyl group,  $R_3$  is a hydrogen atom or alkyl group having 1 to 10 carbons, and  $R_4$  and  $R_5$  are independently an alkyl group having 1-10 carbons (column 2, lines 53-60) and in an amount of that is within 25-45 mol % (column 4, lines 59-61);

C. An acid generator (paragraph [0022]) in the amount of 1 –10 parts by weight (column 8, lines 41-44);

D. An alkali-soluble resin (copolymer (B) – column 5, lines 51-61)) such as a monomer of styrene, (meth)acrylic acid (Table 2 -

Example 9) and hydroxyethyl (meth)acrylate (column 6, lines 3 – 8).

However, Iwanaga et al. fail to disclose the use of a photosensitizing agent comprising a quinonediazide group within the radiation sensitive resists.

Kawata et al. discloses a positive resist composition that comprises a phenolic resin (such as a condensation product of a phenol and aldehyde – column 3, lines 37-41) and a photosensitive agent that is composed of a quinonediazide sulfonate (column 4, lines 40-51) wherein the photosensitive agent is between 1-100 parts per weight and preferably 10-40 parts by weight

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with respect to 100 parts per weight of the phenolic resin (column 16, lines 53 – 54). Too low of a concentration of the photosensitive agent will make it impossible to form a pattern and cause deterioration of resolution. A concentration that is too high will bring about the deterioration of thermal flow resistance (column 16, lines 57-59).

It would have been obvious to one of ordinary skill within the art at the time of the invention to include a photosensitive agent as disclosed by Kawata et al. within the composition of Iwanaga et al. to enhance pattern formation and to prevent deterioration of resolution.

5. Claims 6 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwanaga et al. (US 5,962,180) Kawata et al. (US Patent 5,912,102) as applied to claims 1, 2, 7, 9-11 and 16-19 above, and further in view of Nitta et al (U.S. 2002/0045130).

With respect to claims 6 and 20, Iwanaga et al. in view of Kawata et al. discloses the composition of claim 6 wherein the amounts of said components A, B, C and D are stated above. However, Iwanaga et al. nor Kawata et al. to discloses the use of a compound comprising at least two vinyloxyalkylester groups within the resist.

Nitta et al. discloses a positive-working photoresist composition that comprises a crosslinking polyvinyloxy compound that serves to effect thermal crosslinking with a resin in the formation of the photoresist layer (paragraph [0034]. The use of the polyvinyloxy (vinyl ether group) within a photoresist

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composition produces a patterned resist layer with high pattern resolution and resistance against dry etching (paragraph [0005]).

It would have been obvious to one of ordinary skill within the art at the time of the invention to include the use of a vinyloxyalkyl ester as disclosed by Nitta et al. within the composition Iwanaga et al. and Kawata et al. to further enhance pattern resolution and resistance against dry etching.

### ***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ponder N. Thompson-Rummel whose telephone number is 571-272-9816. The examiner can normally be reached on Monday-Friday 7:00 am - 4:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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